We claim:

1. A method of depositing optical quality films by PECVD (Plasma Enhanced Chemical Vapour Deposition), comprising:

depositing an optical film by PECVD (Plasma Enhanced Chemical Vapour Deposition) in the presence of gases; and

controlling the flow rate of at least one of said gases to minimize unwanted absorption peaks in the deposited film.

2. A method as claimed in claim 1, wherein said optical film is silica.

3. A method as claimed in claim 1, wherein the flow rate of said other gases is maintained substantially constant.

4. A method as claimed in claim 3, wherein the total deposition pressure is maintained substantially constant.

5. A method as claimed in claim 1, wherein said gases include PH_3, and the flow rate of said PH_3 is varied to minimize unwanted absorption peaks in the deposited layer.

6. A method as claimed in claim 5, wherein said other gases comprise SiH_4, N_2O, and N_2.

7. A method as claimed in claim 6, wherein the total pressure is also maintained substantially constant during the deposition.

8. A method as claimed in claim 2, wherein said at least one gas is a gas selected from the group consisting of: diborane, B_2H_6, Arsine (AsH_3), Titanium hydride, TiH_4 or germane, GeH_4, Silicon Tetrafluoride, SiF_4 of carbon tetrafluoride, CF_4.

9. A method as claimed in claim 1, wherein said gases comprise at least three gases whose flow-rate is maintained substantially constant and a fourth gas whose flow rate is varied.

10. A method as claimed in claim 9, wherein said three gases comprise SiH_4, N_2O, N_2 and said fourth gas is PH_3.

11. A method as claimed in claim 10, wherein the SiH_4 gas flow is fixed at about 0.20 std litre/min; the N_2O gas flow is fixed at about 6.00 std litre/min; the N_2 gas flow is fixed at 3.15 std litre/min; and the PH_3 gas flow, is varied among the following values: 0.00 std litre/min; 0.12 std litre/min; 0.25 std litre/min; 0.35 std litre/min; 0.50 std litre/min; and 0.65 std litre/min.

12. A method as claimed in claim 11, wherein the the total deposition pressure is fixed at about 2.60 Torr.

13. A method as claimed in claim 1, further comprising subjecting the films to a post deposition thermal treatment.

14. A method as claimed in claim 13, wherein said post thermal treatment takes place at a temperature between 400 and 1200°C.

15. A method as claimed in claim 14, wherein said thermal treatment takes place at about 800°C.

16. A method as claimed in claim 15, wherein said thermal treatment takes place in the presence of nitrogen.

17. A method as claimed in claim 2, wherein said films are deposited at a temperature between between 100 and 650°C.

18. A method as claimed in claim 17, wherein said films are deposited at a temperature of about 400°C.

19. A method as claimed in claim 1, wherein said optical films form part of an optical waveguide.

20. A method of depositing optical quality films by PECVD (Plasma Enhanced Chemical Vapour Deposition), comprising:

creating a six-dimensional space wherein five dimensions thereof correspond to five respective independent variables of which a set of four independent variables relate to the flow-rate of respective gases, a fifth independent variable relates to total pressure, and a six dimension relates to observed FTIR characteristics; and

depositing an optical film while maintaining three of said set of four independent variables substantially constant as well as said fifth independent variable, and varying a fourth of said set of four independent variables to obtain desired characteristics in said sixth dimension.

21. A method as claimed in claim 20, wherein said optical film is a silica film.

22. A method as claimed in claim 21, wherein said gases include a raw material gas, an oxidation gas, a carrier gas, and a doping gas and said set of four independent variables relate respectively to the flow rates of said raw material gas, said oxidation gas, said carrier gas, and said doping gas .

23. A method as claimed in claim 22, wherein said raw material gas is selected from the group consisting of SiH_4, silicon tetra-chloride, $SiCl_4$, silicon tetra-fluoride, SiF_4, disilane, Si_2H_6, dichloro-silane, SiH_2Cl_2, chloro-fluoro-silane $SiCl_2F_2$, difluoro-silane, SiH_2F_2 and any other silicon containing gases involving the use of hydrogen, H, chlorine, Cl, fluorine, F, bromine, Br, and iodine, I.

24. A method as claimed in claim 23, wherein said oxidation gas is selected from the group consisting of N_2O, oxygen, O_2, nitric oxide, NO_2, water, H_2O, hydrogen peroxide, H_2O_2, carbon monoxide, CO or carbon dioxide, CO_2.

25. A method as claimed in claim 24, wherein said carrier gas is selected from the group consisting of N_2, helium, He, neon, Ne, argon, Ar and krypton, Kr.

26. A method as claimed in claim 25, wherein said doping gas is selected from the group consisting of PH_3, diborane, B_2H_6, Arsine (AsH_3), Titanium hydride, TiH_4 or germane, GeH_4, Silicon Tetrafluoride, SiF_4 and carbon tetrafluoride, CF_4.

27. A method as claimed in claim 20, further comprising carrying out a post-deposition thermal treatment at a temperature between 400 and 1200°C.

28. A method as claimed in claim 27, wherein said post-deposition treatment is carried out in the presence of nitrogen.

29. A method as claimed in claim 27, wherein said post-deposition treatment is carried out at a temperature of about 800°C.